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P1 [a.] means for forming a substantially horizontal body of water, said horizontal body of water having a substantially horizontal surface thereon;

P1 [b. the water of] said horizontal body of water moving in a predetermined direction over said horizontal forming means with a first horizontal velocity[: (1)], wherein said horizontal body of water[: (a) having] has a shape and dimensions thereof that are substantially stable with respect to time;

P1 [c.] means for forming an upwardly inclined body of water, said inclined body of water having an upwardly inclined surface thereon;

P1 [d.] means for joining said horizontal forming means to said upwardly inclined forming means[.];

P1 [e. the water of] said horizontal body of water moving over said joining means and on to said upwardly inclined forming means to form said upwardly inclined body of water[; f. the water of], wherein said upwardly inclined body of water [moving] moves over said upwardly inclined forming means with a second velocity; and

P1 [g.] said upwardly inclined surface of said upwardly inclined body of water having a slope sufficient to permit an object floating by condition of motion thereon to slide down said upwardly inclined surface with a third velocity, relative

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to said second velocity, at least as great as the negative of said second velocity.

2. (Amended) An apparatus as defined in claim 1 wherein said means for forming said upwardly inclined body of water includes first and second interconnected inclined surfaces, said first inclined surface being connected to said means for forming said horizontal body of water, said second inclined surface being connected to said first inclined surface to provide a continuous flow of water over said horizontal surface[,] and said first and second inclined surfaces, said second inclined surface having greater angular inclination with respect to said horizontal surface than said first inclined surface.

3. (Amended) An apparatus as defined in claim 2 wherein the angular inclination of the second inclined surface is sufficient to permit an object floating by condition of motion thereon to slide down said second inclined surface with a velocity greater than the negative of said second velocity.

8. (Amended) An apparatus as defined in claim 6 wherein said body of water substantially conforms to said horizontal surface, and said first and second inclined surfaces.

11. (Amended) An amusement apparatus for water sports activities using a body of water flowing in a predetermined direction, comprising:

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[a.] means for forming an upwardly inclined body of water, said inclined body of water having an upwardly inclined surface thereon;

[b.] said forming means [defining] having an elevated ridge line, said ridge line having first and second ends [sides], [one of] wherein said first [and second sides] end has [having] a greater elevation than [the other of] said [first and] second [sides] end; and

[c. the water of] said upwardly inclined body of water moving over said upwardly inclined forming means with a range of velocity and volume to a pre-determined maximum[; (1)], said inclined body of water:

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[(a)] having a shape and dimensions thereof that are proportional to predetermined velocity and volume ratios, and having[;]:

[i)] at a minimum, [having] a shape and dimensions thereof that are substantially stable with respect to time [at] along said [other side] second end, and having a white water breaking region maintained upstream of said [one side] first end; and

[ii)] at a maximum, [having] a shape and dimensions thereof [from] along said [other side to] second end and along said [one side] first end that are substantially stable with respect to time;

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[ (b) ] having at a minimum, velocity and volume sufficient to form, over a period of time, an inclined body of water that at least flows over said other side; and

[ (c) ] having at a maximum, velocity and volume sufficient to form an inclined body of water that flows over said other side and said one side.

12. (Amended) The apparatus as defined in claim 11 further comprising:

P1 [a.] means for forming [a] an upstream horizontal body of water with a horizontal surface thereon;

P1 [b. the water of] said horizontal body of water moving over said horizontal forming means with a first horizontal velocity[;(1)], wherein said horizontal body of water[:;(d) having] has a shape and dimensions thereof that are substantially stable with respect to time;

P1 [c.] means for joining said horizontal forming means to said upwardly inclined forming means; and

P1 [d. the water of] said horizontal body of water moving over said joining means and on to said upwardly inclined forming means to form said upwardly inclined body of water with said upwardly inclined surface thereon.

13. (Amended) The apparatus as defined in claim 12 further comprising:

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P1 [a.] means for forming [a] an upstream downwardly inclined body of water with a downwardly inclined surface thereon;

P1 [b. the water of] said downwardly inclined body of water moving over said downwardly inclined forming means with a [first] downward velocity[;(1)], wherein said downwardly inclined body of water[: (a) having] has a shape and dimensions thereof that are substantially stable with respect to time;

P1 [c.] means for joining said downwardly inclined forming means to said horizontal forming means; and

P1 [d. the water of] said downwardly inclined body of water moving over said joining means and on to said horizontal forming means to form said horizontal body of water with said horizontal surface thereon.

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16. (Amended) An apparatus as defined in Claim 13 wherein said upwardly inclined body of water and said horizontal body of water and said downwardly inclined body of water having sufficient depth to permit surfing maneuvers thereon, and wherein said upwardly inclined surface of water and said horizontal surface of water and said downwardly inclined surface of water having sufficient width and length to permit surfing maneuvers thereon.

20. (Amended) An apparatus for forming a [A] stably-shaped body of water with a surface thereon, comprising:

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[a. first] means [having a downstream end] for forming a downwardly inclined body of water with a downwardly inclined surface thereon;

[b. the water of] said downwardly inclined body of water moving over said downwardly inclined forming means with a [first] downward velocity[::(1)], wherein said downwardly inclined body of water[::(a) having] has a shape and dimensions thereof that are substantially stable with respect to time;

[c. second] means [having an upstream end] for forming [an] a downstream upwardly inclined body of water with an upwardly inclined surface thereon;

[d. the water of] said upwardly inclined body of water moving over said upwardly inclined forming means with a first upwardly inclined velocity[::(1)], wherein said upwardly inclined body of water[::(a) having] has a shape and dimension thereof that is substantially stable with respect to time;

[e.] said upwardly inclined body of water and said [having an] upwardly inclined surface[::(1)] having a downstream slope sufficient to permit an object floating by condition of motion thereon to slide down said slope with a second [upwardly inclined] velocity, relative to said first upwardly inclined velocity, at least as great as the negative of said first upwardly inclined velocity; and

[f.] means for interconnecting said [first and second] means for forming said downwardly inclined body of water with

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said means for forming said upwardly inclined body of water  
[at said downstream and upstream ends respectively transitioning said body of water from its downward inclination to its upward inclination].

21. (Amended) The apparatus as defined in claim 20 wherein said upwardly inclined body of water having an upwardly inclined surface thereon comprises:

a<sup>6</sup> P<sub>1</sub> [a. having] an upstream slope insufficient to permit an object floating by condition of motion thereon to slide down said slope; [and]

Cont P<sub>1</sub> [b. having] a downstream slope sufficient to permit an object floating by condition of motion thereon to slide down said slope with [a] said second [upwardly inclined] velocity, relative to said first upwardly inclined velocity, at least as great as the negative of said first upwardly inclined velocity; and

P<sub>1</sub> [c. having] a furthermost downstream slope sufficient to permit an object floating by condition of motion thereon to slide down said slope with a third [second upwardly inclined] velocity, relative to said first upwardly inclined velocity, greater than the negative of said first upwardly inclined velocity.

22. (Amended) The apparatus as defined in claim 20 wherein [said interconnecting means includes a portion providing] a means for forming a horizontal body of water is located adjacent and

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between said means for forming said downwardly inclined body of water and said means for forming said upwardly inclined body of water, wherein [and] said upwardly inclined body of water and said horizontal body of water have sufficient depth to permit surfing maneuvers thereon, and wherein said upwardly inclined surface of water and said horizontal surface of water have sufficient width and length to permit surfing maneuvers thereon.

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23. (Amended) The apparatus as defined in claim 20 further comprising [wherein said interconnecting means includes a portion providing] a means for forming a horizontal body of water located adjacent and between said means for forming said downwardly inclined body of water and said means for forming said upwardly inclined body of water, wherein [and] said upwardly inclined body of water and said horizontal body of water and said downwardly inclined body of water have sufficient depth to permit water skimming maneuvers thereon, and wherein said upwardly inclined surface of water and said horizontal surface of water and said downwardly inclined surface of water have sufficient width and length to permit water skimming maneuvers thereon.

24. (Amended) An amusement apparatus for water sports activities using a body of water flowing in a predetermined direction comprising [of]:

*P1*

[a.] means for forming an upwardly inclined body of water, said inclined body of water having an upwardly inclined surface thereon;

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P1 [b.] said forming means having [an area of shaped face having width and length and] a tunnel wave forming area thereon [(1)], said tunnel [waving] wave forming area comprising [;]:

P2 [(a)] [having] a predominantly concave curvature in sections both parallel and normal to the horizontal;

P2 [(b)] a face positioned [facing], as a whole, in a direction angularly displaced with respect to the direction of water flow of said upwardly inclined body of water and having[;]:

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P3 [i)] an inclination with respect to the horizontal; and

P3 [ii)] an attitude with respect to the direction of water flow;

P2 [(c)] said face facing predominantly, at any given point, in a direction [predominantly] tangential to the direction of water flow of said upwardly inclined body of water, whereby said body of water conforms to said concave curvature;

P2 [(d)] [having] a down stream terminus such that the angle of release for [the] said upwardly inclined body of water defines an acute angle with respect to the horizontal; and

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P<sub>2</sub> [(e)] said attitude being greater than ninety degrees and less than parallel with respect to said direction of water flow; [and]

P<sub>1</sub> [c.] a source of water for providing said body of [shallow] water[;], said body of water having:

P<sub>2</sub> [(1)] a depth sufficient [only] to allow water skimming maneuvers thereon;

P<sub>2</sub> [(2)] a velocity which is at least super critical; and

P<sub>2</sub> [(3)] a momentum transfer sufficient to support a user on said surface while performing water skimming maneuvers thereon.

25. ~~(Amended)~~ An amusement apparatus for water sports activities using a body of water flowing in a predetermined direction comprised of:

P<sub>1</sub> [a.] means for forming [an upwardly inclined] a body of water, wherein a portion of said forming means forms an upwardly inclined body of [said] water having an upwardly inclined surface thereon;

P<sub>1</sub> [b.] said forming means having [an area of shaped face having width and length and] a tunnel wave forming area thereon[; (1)], said tunnel [waving] wave forming area comprising[;]:

P<sub>2</sub> [(a)] [having] a predominantly concave curvature in sections both parallel and normal to the horizontal;

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[(b)] a face positioned [facing], as a whole, in a direction angularly displaced with respect to the direction of water flow of said upwardly inclined body of water and having;

P3

[i)] an inclination with respect to the horizontal; and

P3

[ii)] an attitude with respect to the direction of water flow;

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[(c)] said face facing predominantly, at any given point, in a direction [predominantly] tangential to the direction of water flow of said upwardly inclined body of water, whereby said body of water conforms to said concave curvature;

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[(d)] [having] a down stream terminus such that the angle of release for [the] said upwardly inclined body of water defines an acute angle with respect to the horizontal; and

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[(e)] said attitude being greater than ninety degrees and less than parallel with respect to said direction of water flow; [and]

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[(2)] said upwardly inclined surface forming area comprising [including]:

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[(a)] [from] an upstream [boundary,] surface having an upwardly concave curvature [in] with respect to the horizontal [towards an upward incline];

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P<sub>2</sub> [(b)] [between said upstream and a downstream boundary,] an upward incline extending from said upstream surface;

P<sub>2</sub> [(c)] [towards said] a downstream surface having a trailing boundary, convex curvature in sections normal to the horizontal and from an upward incline towards the horizontal;

P<sub>2</sub> [(d)] said downstream [boundary] surface being at an angle from the horizontal;

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P<sub>3</sub> (cont) [(i)] said downstream surface [boundary] having an elevated side and a non-elevated side;

P<sub>3</sub> [(ii)] said elevated side being adjacent [continuous with said downstream boundary of] said tunnel wave forming area;

P<sub>2</sub> [(e)] a face positioned [facing], as a whole, in a direction obtuse to the direction of water flow of said upwardly inclined body of water and having;

P<sub>3</sub> [(i)] an inclination with respect to the horizontal; and

P<sub>3</sub> [(ii)] an attitude with respect to the flow direction;

P<sub>2</sub> [(f)] said face facing predominantly, at any given point, in a direction tangential to the direction of water flow of said upwardly inclined body of water;

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P<sub>1</sub> [c.] a source of water for providing said body of water, said [water of said] upwardly inclined body of water moving over said forming means with a range of velocity and volume to a pre-determined maximum;

P<sub>2</sub> [(1)] said upwardly inclined body of water:

P<sub>3</sub> [(a)] having shape and dimension thereof proportional to pre-determined velocity and volume ratios;

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P<sub>4</sub> [(i)] at a minimum, having a shape and dimensions thereof that are substantially stable with respect to time at said non-elevated side and having white water breaking region maintained upstream and of said elevated side;

P<sub>4</sub> [(ii)] at a maximum, having a shape and dimensions thereof from said non-elevated side to said elevated side substantially stable with respect to time;

P<sub>2</sub> [(2)] said water of said inclined body of water:

P<sub>3</sub> [(a)] having a minimum, velocity and volume sufficient to form, over a period of time, an inclined body of water that at least flows over said non-elevated side and flows upon a portion of said tunnel wave area to form a spilling white water breaking region;

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P3 [ (b) ] having a maximum, velocity and volume sufficient to form an inclined body of water that flows over said non-elevated side and flows over said elevated side and over said tunnel wave area to form a tunnel wave.

Please add the following new claims:

29. A water ride facility wherein the user rides on a flowing body of water, said facility comprising:

a riding surface comprising an inclined portion and an adjacent downstream wave-forming structure elevated above said inclined portion;

means for forming a shallow flow of water at a supercritical velocity on said riding surface, said shallow flow of water flowing up said inclined portion and on said wave-forming structure to form a simulated wave, wherein said user riding on said shallow flow of water utilizes the force of gravity and the momentum of said flow of water to perform water skimming maneuvers thereon; and

said shallow flow of water having a minimal depth and a supercritical velocity sufficient to cause said shallow flow of water to traverse at least a portion of said elevated wave-forming structure, thereby forming said simulated wave without experiencing a drop in velocity to less than a supercritical velocity at said portion, wherein said minimal depth serves to

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[redacted] minimize the energy consumption of said water ride facility and helps prevent said user from drowning.

30. The water ride facility of claim 29, wherein the depth of said shallow flow of water ranges between 2 and 40 cm.

31. The water ride facility of claim 29, wherein said wave-forming structure is concave, whereby a tunnel wave is formed.

32. A water ride facility for amusement parks, water parks and the like, comprising:

a riding surface;  
a wave-forming structure on said riding surface; and means for forming a shallow flow of water on said riding surface and on said wave-forming structure, wherein a user can ride on said shallow flow of water, said shallow flow moving at a velocity sufficient to cause said shallow flow to substantially conform to the contours of said riding surface and to at least a portion of said wave-forming structure, whereby a simulated wave shape is formed upon which said user can ride.

33. The water ride facility of Claim 32, wherein said shallow flow of water moves at a velocity insufficient to cause it to flow completely over said wave-forming structure, whereby a simulated spilling wave is formed upon which said user can ride.

34. The water ride facility of Claim 32, wherein said wave-forming structure is shaped so that said conforming shallow flow of water forms a tunnel wave.

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35. The water ride facility of Claim 32, wherein said wave-forming structure is concave, whereby said shallow flow of water forms a tunnel wave.

36. The water ride facility of Claim 35, wherein said wave-forming structure is concave in both in both vertical and horizontal directions.

37. The water ride facility of Claim 32, wherein said wave-forming structure comprises a front face having an angle of incidence with respect to the direction of said flow of water which varies within a range of 56-90°.

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38. The water ride facility of Claim 31, wherein said wave-forming structure has a vertical cross section which varies along the length of said wave-forming structure wherein the angle of inclination of said vertical cross section varies from about the vertical to about 10° past the vertical in the direction opposite to the direction of flow of said flow of water.

39. The water ride facility of Claim 32, wherein said wave-forming structure has an angle of inclination relative to the direction of said flow of water which is sufficiently gradual to avoid separation or deflection of said flow.

40. The water ride facility of Claim 32, wherein said riding surface comprises a pair of lateral edges, one of said edges being at a higher elevation than the other of said edge whereby an inclination on said riding surface is formed.

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41. The water ride facility of Claim 32, wherein at least a portion of said riding surface is inclined in a direction which is transverse to the direction of said flow of water upon said riding surface.

42. The water ride facility of Claim 32, wherein said riding surface comprises an upstream substantially horizontal portion and a downstream inclined portion.

43. The water ridge facility of Claim 42, wherein said inclined portion of said riding surface comprises a first sub-portion adjacent said substantially horizontal portion and a second sub-portion which is downstream from said first sub-portion, the angle of inclination of said first sub-portion being less than that of said second sub-portion.

44. The water ride facility of Claim 32, wherein said wave-forming structure has a height of 1-6 meters.

45. The water ride facility of Claim 42, wherein the length of said substantially horizontal portion of said riding surface is in the range of 1-1/2 to 4 times the height of said wave-forming structure.

46. A water ride facility for amusement parks, water parks and the like, wherein the user rides on a flowing body of water, said facility comprising:

a riding surface comprising an inclined portion, a downstream ridge portion adjoining said inclined portion, and a declining back portion adjoining said ridge portion; and

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means for forming a shallow flow of water substantially conforming to the contours of said riding surface, said shallow flow of water flowing up said inclined portion and over said ridge portion and down said back portion to form said shallow flow of water upon which non-equilibrium water-skimming maneuvers may be performed by said user on said riding surface.

47. The water ride facility of Claim 46, wherein said ridge portion has a first and second end, wherein said first end is higher in elevation than said second end, said shallow flow having a velocity sufficiently high enough to cause said shallow flow to flow over said first and second ends of said ridge portion while maintaining a supercritical velocity throughout said riding surface.

48. The water ride facility of Claim 46, wherein said velocity of said shallow flow of water is reduced along at least a portion of said ridge portion, wherein said shallow flow of water does not maintain a supercritical velocity on the entire surface of said riding surface, and wherein said lower elevation of said second end permits self-clearing of said shallow flow of water from said riding surface.

49. The water ride facility of Claim 46, wherein said riding surface further comprises an upstream horizontal portion adjoining said inclined portion at a lower elevation than said inclined

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portion, wherein said shallow flow of water flows over said horizontal portion and onto said inclined portion.

50. A water ride facility for amusement parks, water parks and the like, wherein the user rides on a body of flowing water, said facility comprising:

a riding surface comprising a horizontal portion and a downstream inclined portion adjoining said horizontal portion; and

means for forming a shallow body of water flowing on said riding surface, said body of flowing water flowing over said horizontal portion and up said inclined portion, wherein said user can perform non-equilibrium water-skimming maneuvers on all portions of said riding surface.

51. A water ride facility wherein the user rides on a flowing body of water, said facility comprising:

a riding surface comprising an inclined portion and an adjoining downstream ridge portion, said inclined portion comprising a wave-forming structure; and

means for forming a shallow flow of water on said riding surface, said shallow flow of water flowing up said inclined portion, whereby a first portion of said shallow flow of water flows up said inclined portion and over said ridge portion, and a second portion of said shallow flow of water flowing up said inclined portion and on said wave-forming structure to form a simulated wave shape, wherein said user riding on said

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shallow flow of water can utilize the force of gravity and the momentum of said shallow flow to perform water-skimming maneuvers on said riding surface.

52. The water ride facility of Claim 38, wherein said shallow flow of water has a minimal depth and a supercritical velocity sufficient to cause said shallow flow of water to traverse at least a portion of said elevated wave-forming structure, thereby forming said simulated wave at said portion, wherein said minimal depth serves to minimize the energy consumption of said water ride facility and helps prevent said user from drowning.

53. The water ride facility of Claim 38, wherein said wave-forming structure comprises a scoop to channel said shallow flow of water up and transversely across said wave-forming structure.

54. A water ride facility for amusement parks, water parks and the like, comprising:

a riding surface;  
a wave-forming structure on said riding surface;  
a shallow flow of water on said riding surface and on said wave-forming structure wherein a user can ride on said flow of water for amusement and diversion, said shallow flow moving at a velocity sufficient to cause said shallow flow to substantially conform to the contours of said riding surface and said wave-forming structure, whereby a simulated wave shape is formed upon which said user can ride; and

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riding surface in a direction substantially parallel to the direction of flow.

59. The water ride facility of Claim 57, wherein said riding surface is inclined in a direction transverse to the direction of said flow of water.

60. The water ride facility of Claim 57, wherein said riding surface further comprises a substantially horizontal surface portion located adjacent and between said first declining portion and said second inclined portion, wherein said shallow flow of water flows downward on said declining portion, across said horizontal portion and up said inclined portion.

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61. The water ride facility of Claim 57, wherein said riding surface is divided in the direction of flow to form first and second riding portions, and wherein said means for forming a flow of water comprises means for alternately flowing water on said first riding portion and then on said second riding portion.

62. A water ride facility wherein the user rides on a flowing body of water, said facility comprising:

an inclined riding surface;  
means for forming a shallow flow of water up said inclined riding surface, whereupon said user riding on said shallow flow of water utilizes the force of gravity and the momentum of said flow of water to perform water-skimming maneuvers thereon; and

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at least a portion of said wave-forming structure having a height in excess of the total head, after considering friction losses, of said shallow flow, whereby a spilling wave is simulated.

55. The water ride facility of Claim 54, wherein said wave-forming structure directs said shallow flow of water in an upward direction beyond the vertical, whereby a tunnel wave is formed.

56. A water ride facility for amusement parks, water parks and the like, wherein the user rides on a flowing body of water, said facility comprising:

a riding surface comprising a substantially semi-cylindrical shape, said semi-cylindrical shape being transversely positioned with respect to the direction of said flowing body of water; and

means for forming a shallow flow of water at a velocity sufficient to cause said shallow flow to substantially conform to the contours of said riding surface.

57. A water ride facility, comprising:

a riding surface comprising a first declining portion and a second downstream inclined portion adjacent said declining portion; and

means for forming a shallow flow of water on said riding surface.

58. The water ride facility of Claim 57, wherein said riding surface has a dividing means for separating said users on said

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at least one divider on said riding surface for separating said users on said riding surface in a direction substantially parallel to the direction of flow.

63. A method for operating a water ride facility, comprising the steps of:

- (a) providing a riding surface;
- (b) dividing said riding surface into at least two riding sections substantially adjacent one another;
- (c) flowing shallow water upon a first riding section in a direction substantially parallel to said riding sections while at the same time withholding the flow of water on said adjacent riding section;
- (d) terminating the flow of water on said first riding section to enable riders thereon to exit; and
- (e) flowing water on said adjacent riding section to allow riders to ride thereon while riders exit said first riding section.

64. A method for operating a water ride facility, comprising the steps of:

- (a) providing an inclined riding surface having a ridge portion and a wave-forming structure;
- (b) flowing a shallow flow of water upward upon said inclined riding surface at a first velocity, said velocity being insufficient to allow said flow of water to rise above

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said ridge portion or said wave-forming structure whereby a spilling wave is formed.

65. The method of Claim 64, further comprising the step of increasing said first velocity to a second velocity which is sufficient for said flow of water to flow over the top of said ridge portion but insufficient to flow over the top of said wave-forming structure, whereby the shoulder of a wave is formed on said wave portion and a spilling wave remains on said wave-forming structure.

66. The method of Claim 65, further comprising the step of increasing said second velocity to a third velocity which is sufficient to climb up on said wave-forming structure to form a curling wave thereon.

67. The method of Claim 66, further comprising the step of increasing said third velocity to a fourth velocity which is sufficient to climb up on said wave-forming structure so as a tunnel wave is formed thereon.

68. The apparatus as defined in Claim 20, wherein said interconnecting means has a degree of decline transverse to the direction of flow sufficient to permit an object floating by condition of motion thereon to move in the direction of decline due to the force of gravity.